

Fig. 1

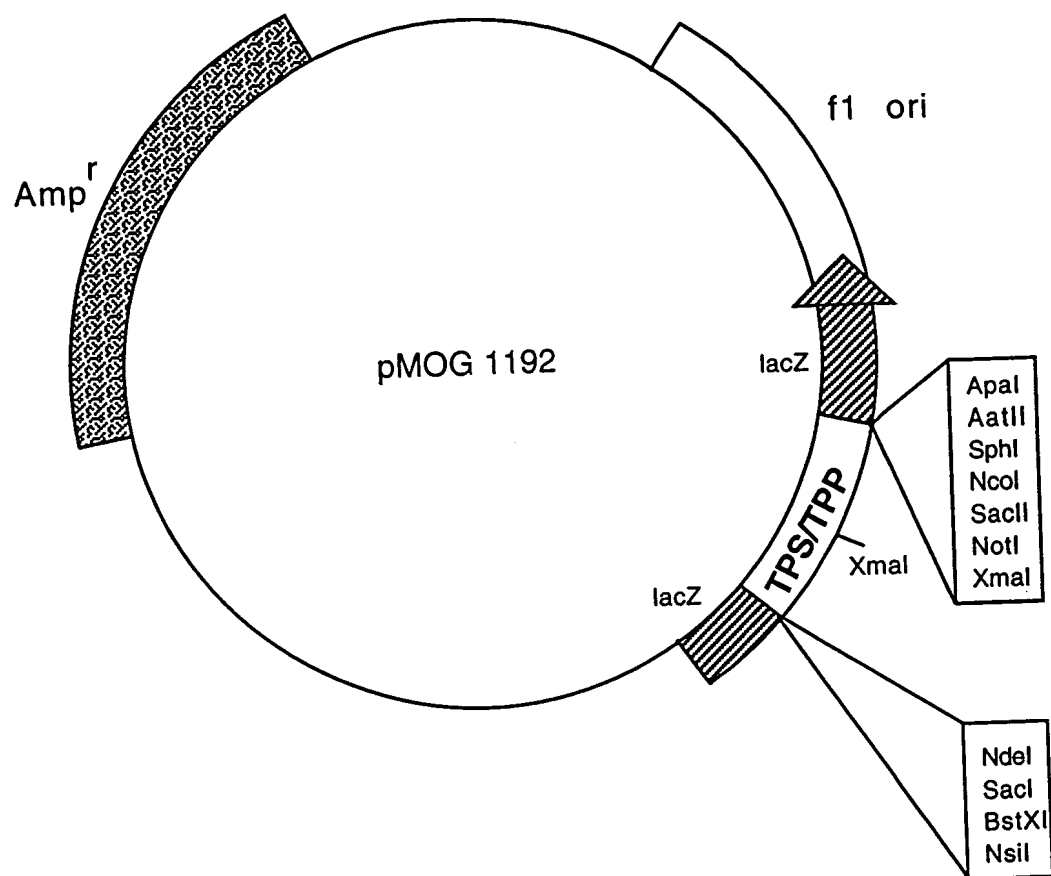


Fig. 2

AA.	238
I	P Y A V P G G R F N E L Y G W D S Y M N A L G L L E A N K T D V A R G M V
Yeast	P F I V P G G R F V E F Y Y W D S Y W V M E G L L S E M A E T V K G M L V
Rabbit	P Y V V P G G R F R E V Y Y W D S Y F T M L G L A E S G H W D K V A D M V
E. coli	G F I V P G G R F K E I Y Y W D A Y W I I E G L L I T D M T E T A K G M I
Silkw.	Tase25----->
	Tase24 -----> 308 I
AA.	E H F I F E I N H Y G K I L N A N R S Y Y L C R S Q P P F L T E M --- Q N F L D L V T A Y G H I P N G G R V Y Y L Q R S Q P P L L T L M --- A N F A H E I D T Y G H I P N G N R S Y Y L S R S Q P P F F A L M --- E N L I E L L Y K F G H I P N G S R W Y Y Q E R S Q P P L L A A M --- Tase26<-----
AA.	644 I 664
Yeast	- - - A A T E G F G W V T N A R Y I L L G L K Y M N - - -
Rabbit	- - - E V Q E G F G W T N G - - - V A L M L L D - - -
E. coli	- - - P L Q D G F G W T N G - - - V T L K M L D - - -
Silkw.	- - - V V Q S G F G W T N G - - - V V L E F I N - - - Tase27<-----

Fig. 3

Comparison of trehalase sequences derived from different species.

	1				50
Ecoli2treh	.....	.....	..MLNQKIQN	PNPDELMIEV	DLCYELDPYE
Ecolitreha	.....	.....	...MKSPAPS	RPQKMALIPA	CIFLCFAALS
Bonmotreha	.....	.....	.....	.....MRLF	LLLVLGTTV.
Tenmotreha	.....	.....	.....	.....MIPF	LLMVAFADTV
Rabbitreha	.....	.....	.....	MPGSTWELHL	LLLLLGLG...
Potatotreha	.....	.....	.....	..MGKAIIFM	IFTMSMMNIK
Yeasttreha	MSVFDNVSPF	KKTGFGKLQQ	TRRGSEDDTY	SSSQGNRRFF	IEDVDKTLNE
	51				100
Ecoli2treh	LKLDemieAE	PEPEMIEGLP	ASDALTPADR	YL.....	.....ELFEH
Ecolitreha	VQAEETPVTP	QPPDILLG..	.....	.....	.....PLFND
Bonmotreha	..IADDLPPT	CIRPVY....	.....C	NS.....	.....TLLHY
Tenmotreha	LQVSAQSQPS	CDSKVY....	.....C	QG.....	.....KLLHV
Rabbitreha	LGSEQALPPP	CESQIY....	.....C	HG.....	.....ELLHQ
Potatotreha	AETCKSIDKG	PVIPTT....	.....P	LV.....	.....IFLEK
Yeasttreha	LLAAEDTDKN	YQITIEDTGP	KVLKVGTRANS	YGYKHINIRG	TYMLSNLLQE
	101				150
Ecoli2treh	VQSAKIFP..	....DSKTFP	DCAPKMDPLD	ILIRYRKVRR	HRDF.....D
Ecolitreha	VQNAKLFP..	....DQKTFA	DAVPNSDPLM	ILADYRMQON	QSGF.....D
Bonmotreha	VQMARLYP..	....DSKTFV	DFQMRKDENA	TLSAQELLD	RTNHNPTKED
Tenmotreha	VEMSRIFN..	....DSKTFV	ELKMINDEQT	TLENFDNFLR	DTNHRKTRAD
Rabbitreha	VQMARLYP..	....DDKQFV	DMPLSTAPDQ	VLQSFAELAA	TYNNTVPREQ
Potatotreha	VQEAALQTYG	HKGFDKLFV	DMSLRESLSE	TVEAFNKLPR	VVNGSISKSD
Yeasttreha	LTIKSFGRH	QIFLDEARIN	ENPVNRLSRL	INTQF.....	.WNSLTRRD
	151				200
Ecoli2treh	LRKFVENHFW	L.....	.....P	EVYSSEYVSD	PQN.SLKEHI
Ecolitreha	LRHFVNVTFT	L.....	.....P	KE.GEKYVPP	EGQ.SLREHI
Bonmotreha	LQEFVVDFFD	E.TSELEEWK	PDDHK..ENP	P.FLAKIRDQ	GFR.EFAKAL
Tenmotreha	LMKFVSDNFK	Q.ENEFESWT	PTDFT..DNP	T.LLSRIEDK	TIR.QFAQDL
Rabbitreha	LEKFVQEHFQ	AVGQELSWT	PGDWK..ESP	Q.FLQKISDP	KLR.AWAEQL
Potatotreha	LDGFIGSYLS	SPDKDLVYVE	PMDFV..AEP	EGFLPKVKNS	EVR.AWALEV
Yeasttreha	LNNVGEIAKD	TKIDTPGAKN	PRIYVPYDCP	EQYEFYVQAS	QMHPSLKLEV
	201				250
Ecoli2treh	DQLWPVLTRE	PQDHI....P	WSSLLALPQ.	.....	..SYIVPGGR
Ecolitreha	DGLWPVLTRS	TENTE....K	WDSLLPLPE.	.....	..PYVPGGR
Bonmotreha	NDIWPTLARR	VKPSVLEKPE	QSSLVPMTH.	.....	..GFIVPGGR
Tenmotreha	VKIWPTLARK	VKKEVLDPY	HYSLLPVDN.	.....	..GFIIPGGR
Rabbitreha	HLLWKKLGGK	IKPEVLSQPE	RFSLIYSQH.	.....	..PFIVPGGR
Potatotreha	HSLWKNLRSK	VADHVLEKPE	LYTLPLKLN.	.....	..PVIIPGSR
Yeasttreha	EYLPKKITAE	YVKSVDNTPG	LLALAMEEHF	NPSTGEKTLI	GYPYAVPGGR
	251				300
Ecoli2treh	FSEYYWDSY	FTMLGLAESG	REDLLKCMAD	NFAWMIENYG	HIPNGNRTYY
Ecolitreha	FREVYYWDSY	FTMLGLAESG	HWKQVADMVA	NFAHEIDTYG	HIPNGNRSYY
Bonmotreha	FKEIYYWDAY	WIEGLLLITD	MTETAKGMIE	NLIELLYKFG	HIPNGSRWYY
Tenmotreha	FTEFYWDSY	WIVEGLLLSD	MHETVRGMLD	NFLSIVEKYG	FIPNGARVY
Rabbitreha	FVEFYWDSY	WVMEGLLLSE	MAETVKGMLQ	NFLDLVTAYG	HIPNGGRVYY
Potatotreha	FKEVYYWDSY	WVIRGLLASK	MYETAKGIVT	NLVSLIDQFG	YVLNGARAYY
Yeasttreha	FNELYGWDSY	MMALGLLEAN	KTDVARGMVE	HFIFEINHYG	KILNANRSYY

Fig. 4-1

08779460-052797

	301				350
Ecoli2treh	LSRSQPPVFA	LMVELFEEDG	VR.....GA	..RRYLDHLK	MEYAFWMDGA
Ecolitreha	LSRSQPPFFA	LMVELLAQHE	GD.....AA	.LKQYLPQM	KEYAYWMDGV
Bommotreha	QERSQPPLLA	AMIKLYYEKT	KD.....IE	FIRKYISALE	KELEYWLDT.
Tenmotreha	LNRSQPPLLT	LMVSLYVSAT	ND.....ME	WLAKNIRTID	TELRFWLNN.
Rabbitreha	LQRSQPPLLT	LMMDRYVAHT	GD.....LA	FLRENIETLA	LELDFWAEN.
Potatotreha	SNRSQPPVLA	TMIVDIFNQT	GD.....LN	LVRRSLPALL	KENHFWNSGI
Yeasttreha	LCRSQPPFLT	EMALVVFKKL	GGRSNPDAVD	LLKRAFQASI	KEYKTVWTAS
	351				400
Ecoli2treh	ESLIPNQAYR	HVVRMPDGSL	LNRYWDDRDT	PRDESWLEDV	ETAK.HSG.R
Ecolitreha	ENLQAGQOEK	RVVKLQDGT	LNRYWDDRDT	PRPESWVEDI	ATAKSNPN.R
Bommotreha	.HLIA.....	.FNKDDRVT	LLRYIIPSAG	PRPESYYEDY	ELAQKLDKNT
Tenmotreha	.RLVD.....	.VVKDGIYK	LAQYNSNSGS	PRPESYYEDV	TTASVFSDE
Rabbitreha	.RTIS.....	.VSSGNSHT	LNRYHVPYGG	PRPESYSKDT	ELAHTLPEG.
Potatotreha	HKVTI.....	.QDAQGSNHS	LSRYYAMWNK	PRPESSTIDS	ETASVLPNIC
Yeasttreha	PRL.....	.....DPETG	LSRYHPNGLG	IPPETESDHF	DTV.LLPYAS
	401				450
Ecoli2treh	PPNEVYRDLR	AGAASGW...	.DYSSRWL...	...RDTGRLA	SIRTTQFIP.
Ecolitreha	PATEIYRDLR	SAAASGW...	.DFSSRWM...	...DNPQQLN	TLRITTSIVP.
Bommotreha	DPNDIYADLK	SAAESGW...	.DFSTRWFIS	ESGDNSGNLT	NLNTKNVIP.
Tenmotreha	DKAELYMDLK	SAAESGW...	.DFSSRWIVD	EYGGTRGNLS	ALHTTRIIP.
Rabbitreha	SWETLWAEK	AGAESGW...	.DFSSRWLVG	..SPNPDSL	SIRTSKLVP.
Potatotreha	EKRELYRELA	SAAESGW...	.DFSSRWM...	...SNGSDLT	TTSTTSILP.
Yeasttreha	KHGVTLDEFK	QLYNDGKIKE	PKLDEFFLHD	RGVRESGHDT	TYRFEQVCAY
	451				500
Ecoli2treh	...IDLNAFL	FKLESAIANI	SALKGEKE..	.....TE	ALFRQKASAR
Ecolitreha	...VDLNSLM	FKMEKILARA	SKAAGDNA..	.....MA	NQYETLANAR
Bommotreha	...VDLNAIF	AGALQITANF	QAILKNPR..	.....RA	AHWGYMAEQW
Tenmotreha	...VDLNAFL	CQAFQKLSEF	YQTLGDYP..	.....NA	TFWSKLVKIW
Rabbitreha	...VDLNAFL	CQAEELLSGF	YSRLGNES..	.....QA	TKYRNLRQNR
Potatotreha	...VDLNAFL	LKMELDIAFL	ANLVGESS..	.....TA	SHFTEAAQNR
Yeasttreha	LATIDLNSLL	YKYEIDIADF	IKFECDDKYE	DPLDHSITTS	AMWKEMAKIR
	501				550
Ecoli2treh	RDAVNRYLWD	DENGIYRDYD	WRREQ....	.....A	LFSAAAIVPL
Ecolitreha	QKGIEKYLWN	DQGWYADYD	LKSHKV....	.....RN	QLTAAALFPL
Bommotreha	RSSIEQALWD	EEDGVWHDYD	ILNNK....	.....PRR	YFYTSNLAPL
Tenmotreha	QHSIEMVHYN	RDDGIWYDWD	NELSQ....	.....HRR	MFFPSNFAPL
Rabbitreha	IAALTALLWD	EDKGAWFDYD	LENQK....	.....KNH	EFYPSNLTPL
Potatotreha	QKAINCIFWN	AEMGWLDYW	LTNSDTSEDI	YKWEDLHONK	KSFASNFVPL
Yeasttreha	QEKITKYMWD	DESGFFFDYN	TKIKH....	.....RTS	YESATTFWAL
	551				600
Ecoli2treh	YVGMANHEQA	DRLANAVRSR	LLT.....P	GG...ILASE	YETGEQWDKP
Ecolitreha	YVNAAAKDRA	NKMATATKTH	LLQ.....P	GG...LNTTS	VKSGQQWDAP
Bommotreha	WMNAVEKPFL	AKHGARVLEY	LHESQALEYP	GG...VPVSL	VNSGEQWDFP
Tenmotreha	WSETFDSRNA	EILGEMAAEY	FITQNMMDYH	GG...IPTSL	SHTGEQWDYP
Rabbitreha	WAGCFSDPAI	A...DKALQY	LQDSQILNHR	HG...IPTSL	QNTGQQWDFP
Potatotreha	WTE.ISCSDN	NIT'TQKVVS	LMSSGLLQ.P	AG...IAMTL	SNTGQQWDFP
Yeasttreha	WAGLATKEQA	QKMVEKALPK	LEMLGGLAAC	TERSRGPI SI	SRPIRQWDYP

Fig. 4-2

	601				650
Ecoli2treh	NGWAPLQWMA	IQGFKMYG..	.DDLLGDEIA	RSWLKTVNQF	YLE.QHKLIE
Ecolitreha	NGWAPLQWVA	TEGLQNYG..	.QKEVAMDIS	WHFLTINVQHT	YDR.EKKLVE
Bommotreha	NAWPPEVSIV	VTAIQNIGSE	ESSKLAKELA	QVWVRACKSG	FTE.KKQMF
Tenmotreha	NAWPPMQSII	VMGLDKSGSY	RAKQLARELA	RRWVKANLIG	FRQ.TGEMFE
Rabbitreha	NAWAPLQDLV	IRGLAKSPSA	RTQEVAFQLA	QNWIRTNFDV	YSQ.RSAMY
Potatotreha	NGWPPLQHII	IEGLLRSGLE	EARTLAKDIA	IRWLRTNYVT	YKK.TGAMY
Yeasttreha	FGWAPHQILA	WEGLRSYGYL	...TVTNRLA	YRWLFMMTKA	FVDYNGIVVE

	651				700
Ecoli2treh	KYHIADGVPR	EGGGGEYPLQ	.....D	GFGWING...	VVRRLIGLYG
Ecolitreha	KYDVSTTGT.	GGGGGEYPLQ	.....D	GFGWING...	VTLKMLDLIC
Bommotreha	KYDALNAGKY	.GGGGEYTVQ	.....D	GFGWSNG...	VVLEFLDRYG
Tenmotreha	KYNVEVPGQN	.GGGGEYVVQ	.....S	GFGWING...	VVLEFINQFF
Rabbitreha	KYDISNA.QP	.GGGGEYEVQ	.....E	GFGWING...	VALMLLDLYG
Potatotreha	KYDVTKCGAY	.GGGGEYMSQ	.....T	GFGWSNG...	VVLALLEEFG
Yeasttreha	KYDVTRGTDP	HRVEAEYGNQ	GADFKGAATE	GFGWVNARYI	LGLKYMNSYE

	701			732
Ecoli2treh	EP.....	.....	.....	..
Ecolitreha	PKEQPCDNVP	ATRPTVKSAT	TQPSTKEAQP	TP
Bommotreha	AVLTSVDSVD	ASANNGQSNE	ESETDSKEK.	..
Tenmotreha	TT.....	.....	.....	..
Rabbitreha	DRLSSGTQLA	LLEPHCLAAA	LLLSFLTR..	..
Potatotreha	WPEDLKIDC.	.....	.....	..
Yeasttreha	RREIGACIPP	ISFFSSLRPQ	ERNLYGL...	..

Fig. 4-3

08779450-056797

Trehalase activity in tobacco leaves transgenic for a potato trehalase cDNA

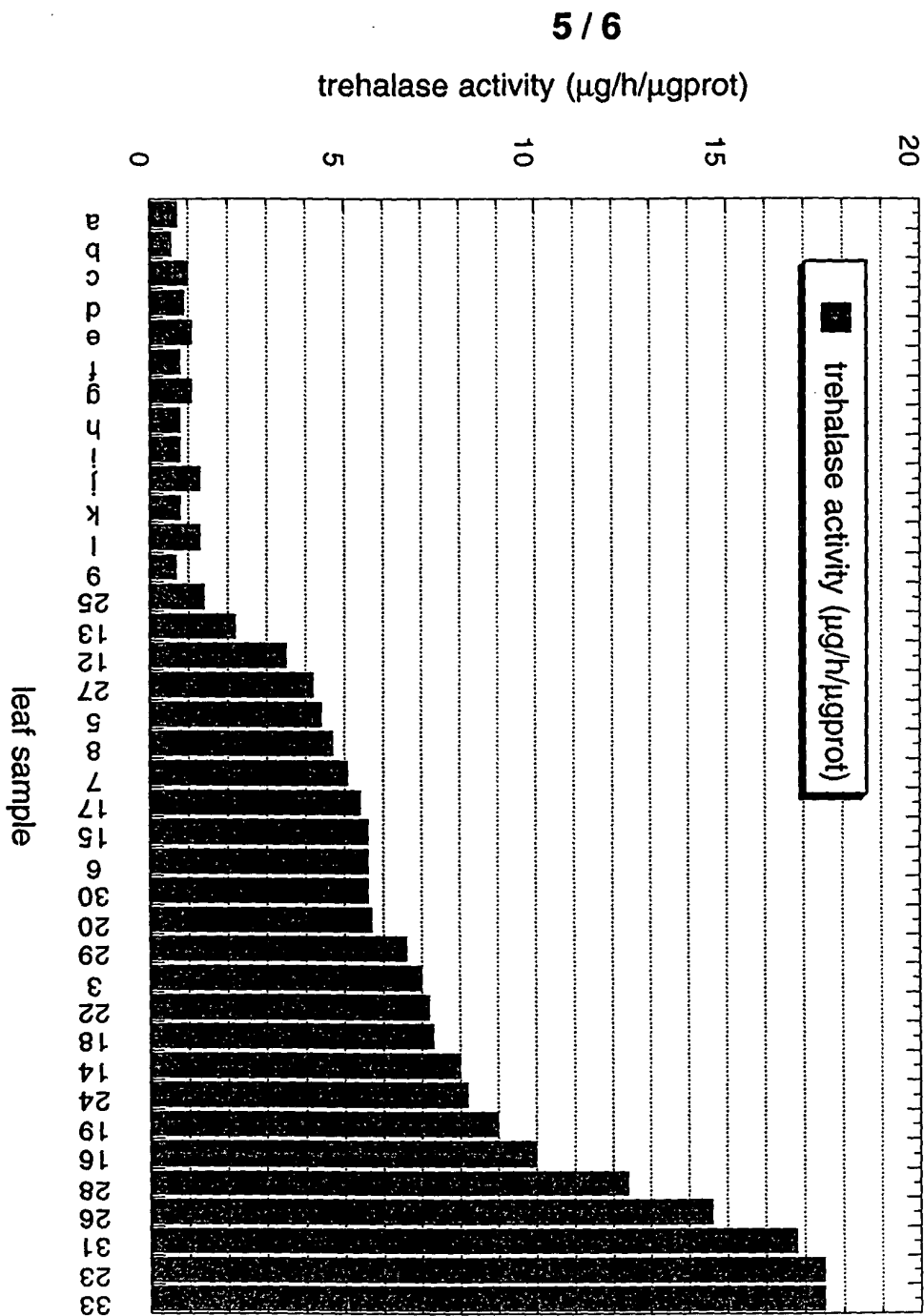


Fig. 5

Trehalose accumulation in microtubers

trehalose <i>mg.g⁻¹ fresh weight</i>					
pMOG1027 (845-11)		pMOG1027 (845-22)		pMOG1027 (845-28)	
9a	0.08	7a	0.02	3a	0.04
9b	0.21	7b	0.01	3b	0.15
11a	0.01	9a	0.02	15a	0.4
11b	0	9b	0.02	15b	ND
...		12a	0.09	18a	0
...		12b	0	18b	0.2
...		15a	0	26a	0.12
...		15b	0.01	26b	0.22
...		32a	0.01	27a	0.02
...		32b	0	27b	0.01
...		34a	0.01	31a	0.2
...		34b	0.01	31b	0.1
...		36a	0.01	34a	0.48
...		36b	0	34b	0.75
				38a	0.08
				38b	0.12
N= 25		N= 30		N= 29	

Fig. 6